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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,133	02/26/2004	Funiyoshi Kirino	111072.01	5090
25944	7590	02/11/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			MCDONALD, RODNEY GLENN	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/786,133

Applicant(s)

KIRINO ET AL.

Examiner

Rodney G. McDonald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 55-60 and 62-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 55-60 and 62-66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2-26-04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 55-57, 60, 63, 65 and 66 are rejected under 35 U.S.C. 102(b) as being anticipated by Nelson et al. (U.S. Pat. 5,232,569).

Regarding claims 55, 60, 63, Nelson et al. teach a method and apparatus for producing a film utilizing microwaves at the electron cyclotron resonance to create a region of plasma which is devoid of magnetic field and at least one high-radio frequency planar disk diode positioned within the region devoid of magnetic field, a target attached to the rf planar diode and a high radio frequency substrate biasing electrode parallel to the planar diode. (See Abstract) The apparatus can be used to deposit coatings for magnetic recording applications. The materials for the thin layers to be deposited on metal substrates can include a hard, refractory, chemically inert first coating, a second coating consisting of chromium, a suitable chromium-vanadium alloy, or any other appropriate chromium alloy, a third coating consisting of an appropriate cobalt-chromium alloy, cobalt-chromium-tantalum alloy, or any other suitable cobalt alloy; a fourth coating consisting of titanium as an interfacial adhesion layer; and a fifth coating consisting of amorphous carbon with high diamond-like content but with some graphite content. (Column 8 lines 61-68; Column 9 lines 1-13) The antennae array 14 of the

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apparatus operates in the electron cyclotron resonance mode to produce a plasma.

(Column 5 lines 57-61; Column 10 lines 47-49) The plasma sputters the target.

(Column 7 lines 63-68) A bias voltage is applied to the substrate platen to control the

film morphology of the depositing film. (Column 8 lines 24-29) The layer to be

deposited can be at least a magnetic layer from magnetic targets. (Column 8 lines 18-

23) Nelson et al. envisages utilizing the apparatus to deposit the other layers in a

magnetic medium including a first hard, refractory, chemically inert coating, a chromium

layer a Cr-V alloy or other appropriate chromium alloy layer, a titanium interfacial

adhesion layer and a protective layer having amorphous carbon in it. (Column 8 lines

61-68; Column 9 lines 1-13)

Regarding claims 56 and 65, microwave is used to generate the resonance.

(See Abstract)

Regarding claims 57 and 66, a radio frequency power source is utilized to apply a bias to the substrate. (Column 8 lines 23-29)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 55, 58, 59, 60 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (U.S. Pat. 5,232,569) in view of Howard (U.S. Pat. 4,778,582).

Nelson et al. is discussed above and all is as applies above. (See Nelson et al. discussed above)

The difference not yet discussed is where the protective layer is formed from a target of carbon and where sputtering gas contains argon and contains at least one of nitrogen and hydrogen.

Howard teach sputtering a protective layer on a magnetic disk by utilizing a graphite target (i.e. carbon target) and utilizing an Ar and H<sub>2</sub> atmosphere. (Column 3 line 23, lines 35-40)

The motivation for forming a protective layer from a target of carbon and where sputtering gas contains argon and hydrogen is that it allows for producing a layer that has good corrosion resistance and wear resistance. (Column 1 line 68; Column 2 lines 1-2)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Nelson et al. by forming the protective

layer form a graphite target and in a sputtering atmosphere of Ar and H<sub>2</sub> as taught by Howard because it allows for producing a layer that has good corrosion resistance and wear resistance.

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Claims 60 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (U.S. Pat. 5,232,569) in view of Ohno et al. (U.S. Pat. 4,842,917).

Nelson et al. is discussed above and all is as applies above. (See Nelson et al. discussed above)

The difference between Nelson et al. and the present claims is that the atmosphere comprising oxygen is not discussed.

Ohno et al. teach forming an underlayer for a magnetic thin film containing as a principal component at least one of Cr and Mo. (Column 5 lines 30-33) The crystallographic orientation for the magnetic film can be made random and the crystalline size reduced simply by adding a predetermined amount of an oxidizing gas, e.g. oxygen, air or water vapor, to an Ar gas atmosphere which is used when the thin film is formed by a method such as sputtering. (Column 5 lines 39-47)

The motivation for utilizing oxygen for deposition of the underlayer is that it allows for reducing the crystalline size of the magnetic film. (Column 5 lines 39-47)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Nelson et al. by utilizing oxygen in the sputtering gas when sputtering the underlayer as taught by Ohno et al. because it allows for reducing the crystalline size of the magnetic film.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
February 8, 2005